S P E C I F I C A T I O N S

FOR

PROPOSED MISSIONARY LAUNCH

FOR

THE PRESBYTERY OF ALASKA

LEE & BRINTON INC.
Naval Architects & Engineers
Seattle Washington

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1. DIMENSIONS: Length over all about 61 feet
Beam over planking 15 feet
Depth 10 feet 8 inches
Engine - Diesel type 60 - 80 H.P.

2. GENERAL: The arrangement of the boat will be as shown on the plan marked drawing #2. The outboard profile will be similar to that shown on the plan marked drawing #1. The general construction will be equal to that shown on plan marked drawing #3. With these plans and with the following specifications it is the intention to describe the construction of the launch complete in every way and ready for sea with the exception of certain articles and equipment as hereinafter mentioned as being supplied by the owners. All articles supplied by the owner will be cared for by the contractor who will be responsible for them on delivery at the shipyard. All woodwork that is necessary for the installation of these articles will be done by the contractor. Where work is to be performed by outside parties, the contractor will give to them all the facilities of his plant in order that they may readily perform their work.

. VESSEL TO BE BUILT UNDER COVER.

3. PLANS:

The architects will furnish the contractor with line draft, table of offsets, general arrangement and construction plans and all other details they believe necessary. The vessel is to be built in strict accordance with these specifications and plans and any item inadvertently omitted from these specifications but shown on the plans or vice versa, or anything not expressly set forth in either, but which is reasonably implied to complete the vessel, shall be furnished and perform the same as though specially shown and mentioned in both. Any point of conflict between the plans and specifications shall be referred to the architects for their interpretation and their decision shall be final in any dispute that may arise concerning the meaning of any word or clause of these specifications or the details of any plan drawing. No deviation is to be made from the plans and specifications without the consent in writing from the owners or his authorized agent.

4. WORKMANSHIP & MATERIALS:

The workmanship throughout is to be of the best quality in accordance with the usual practice for vessels of this type. Any faulty workmanship or materials shall be replaced at whatever state of construction they may be discovered. The owner or his agent shall have the right at all times during the construction to inspect the work in progress and the materials furnished therefor. Only the best grade of materials will enter into the construction of this vessel. Except where otherwise specified, all lumber shall be winter cut Washington Fir, free from rot, sap, loose knots, shakes, pitchpockets, and all other imperfections.

All iron fastenings will be galvanized and all screws will be either galvanized or brass. Door hinges, locks, coathbes, window stops, etc. to be of brass of the heavy marine pattern.

5. KEEL:

Keel to be 7½" x 11½" in one length from the forefoot to the stern post. To be rabbetted for the garboard strake.

6. SHOE:

Shoe shall be of iron bark or other approved hardwood finishing not 1½" x 7½" in not more than four lengths running the full length of the keel, extending under the forefoot, and nibbed into forward deadwoods. To be neatly chamfered on the lower corners and to be fastened to the keel with 3" spikes spaced not over 12" apart and staggered. The underside of keel and top of shoe will receive a coat of the best lead paint before being assembled. Between the shoe and keel there will be placed a sheet of lead not less than 4# per sq. ft. turned up 4" on each side of keel. Shoe will not be put on until the bolts connecting the keel, floors and keelson are clinched on the under side of keel as hereinafter specified.

7. STEM:

To be of tough fir butt sided 7½" and molded as shown. It will be rabbited to take hood ends of planks. The front face will have a siding of 2½" and fitted with an iron stem band 2½" wide at the afterside, to completely cover the forward face of the stem and to be widened at the forefoot as necessary. The front face of the stem band will be sided 1". The depth of the stem band at the L.W.L. and above will be 2". Below the L.W.L. it will decrease in depth as shown on the plans. Under the forefoot it will be flattened and lapped onto the shoe. Its head will be flattened and turned over the stemhead with a forged eye to take forstay. It will be fastened with 3/8" x 7" countersunk headed spikes spaced not over 12".

8. DEADWOODS:

Deadwoods sided 7½" and built up as shown all securely fastened with 7/8" bolts clinched over rings. Stop-watered where necessary.

9. STERNPOST:

To be of oak, iron bark or other approved hardwood 11½" x 11½" with rabbet for planking. To be dove-tailed into keel and mortised into horntimber, and securely fastened with 3/4" bolts. These will be clinched wherever possible. The after face of the stern post will be tapered as later directed.

10. SHAFT LOGS:

In two pieces 7½" x 11½" snugly fitted together with a pine tongue. Hollowed to receive shaft sleeve with a 5" hole counterbored for stern bearing and stuffing box. Fastened with 3/4" bolts. They will be mortised into sternpost 2".

11. HORN TIMBER:

Horn Timber sided 11½" and molded 7½". Rabbited for planking and connected to transom timber with a 3" knee, and to sternpost with a 5" knee.

12. TRANSOM:

Transom will be bent to shape of 2½" oak in narrow widths edge bolted with 5/8" rods spaced about 15". Battens spaced 15" of oak 3" x 3½"

run vertically from bottom of transom to deck., well fastened to each plank.

13. FRAMES:

Frames of white oak steambent in one piece running from keel to covering board 3" x 3½" laid on their flat spaced 14". In way of engine 10 extra frames will be run alongside of main frames extending out to bilge clamps. Frames will be boxed into deadwoods at ends.

14. CENTER KEELSON:

5½" x 11½" laid on its flat on top of keel cut out for frames, as shown. Fastened to keel with one 3/4" drift bolt driven through a ring and headed over ring on the lower end. These fastening spaced 14" centers, and staggered.

15. FLOORS:

3½" x 5½" set on top of frames and fastened to them with two ½" carriage bolts and one 5" spike. There will be one 3/4" x 18" drift bolt driven through each floor, with a ring on top, passing into keel. In way of engine floors will be increased in height as shown and sided 7½" and extra fastenings will be fitted as may be necessary.

16. CLAMPS:

At the turn of the bilge there will be three strakes 2½" x 5½" run in long lengths edge bolted at all butts and fastened to each frame with one ½" screw bolt, or rivet and one 5" spike. Toward ends clamps will be reduced in siding and thickness. For the full length of the vessel a side clamp will be run 2½" x 5½" members scarphed and edge bolted. At the after end a shelf for the quarter-deck beams will be placed on this clamp. It will be fastened to frames like bilge clamps.

17. MAIN DECK CLAMP:

2½" x 7½" run directly under the main-deck beams and fastenéd to frames with two ½" screw bolts. Members will be scarphed and edge bolted in an efficient manner.

18. MAIN-DECK SHELF:

Run on the inside of clamp directly under beams, sawn to shape and to finish not less than 5½" x 2½". Fastened to clamp with two screw bolts between each frame. Members will be scarphed and edge fastened. All fastenings will be ½" diameter.

19. QUARTER DECK SHELF:

Placed on top of side clamp finishing 2½" x 5½" fastened to clamp with two ½" drift bolts in each frame space.

20. BREAST HOOKS:

At the ends of the vessel all clamps and shelfs will be connected with breast hooks where required.

21. BEAMS:

Generally sided 2" and heavier beams under deck house coamings at ends of hatches, etc. All beams will be sawn with a crown on their top edge of 3½" in 14 ft. They will be molded 3" deep at their ends. Their bottom edge will be straight. The top edge will neatly fit the sheer of the ship. Generally they will be spaced about 14" dnd placed alongside of frame heads.

Fastened to clamp with one ½" drift bolt and to shelf with two ½" screw bolts. Carlins will dovetail into fore-and-afters which will be at least 3/4" deeper than the beams they span and will be sawn with the sheer of the deck. Where required 5/8" screw bolts, with nuts countersunk into fore-and-afters will connect these fore-and-after members with alternate frame heads.

22. DECKING:

The main-deck and quarter-deck will be planked with V.G. 1¾" thick 2½" wide run with a caulking seam, and will be nibbed into covering board or strake placed inside of covering board. Covering board finished not less than 9½" wide, sawn to shape.

All planks will be fastened with one 4" spike at each crossing. Holes counterbored and plugged. Seams caulked with two threads cotton payed with pitch or tar.

Around the main and quarter decks a chock will be carried into which will be set the rail stanchions. It will be fastened to the sheer strake with ½" drift bolts spaced about 14" and to each deck beam. At the stem these chocks will be fitted with a breast hook and edge fastened. Chock members will be scarphed one to another. Scuppers cut on under side as shown.

23. OUTSIDE PLANKING:

Outside Planking to finish 1¾" thick. All above the water line to be V.G. All planks run in long lengths with butts in adjoining strakes five frame spaces apart. Butt blocks will be of oak 2½" thick extending from frame to frame and as wide as the planks they connect. Fastening will be turned over on the inside of frame, two nails in planks under 6" in width and three in planks up to 8" in width and four in planks over 8" in width. Nail holes above the waterline will be plugged and below the water line cemented. All planks will be drilled for fastenings and counterbored for heads. Seams caulked with one thread of cotton and two of oakum. Garboard strake will be 2½" x 11½", members scarphed and edge bolted. Sheerstrake will be 2½" x 7½", members scarphed and edge bolted.

24. FENDERS:

Fenders run as shown on the plans and built up as detailed. Rubbing strake finished 3½" x 1½" of iron bark with nail holes plugged. At the stem straps will connect fenders together. They will pass under the stem iron, will be 5 feet long, of 3" x 1/8" steel drilled for C.K. headed #14 wood screws. Similar straps will be placed around the corners on the after quarters.

25. BULKHEADS:

Bulkheads will be placed on frames 7, 14, 24, 37, 45, & 48. All of double diagonal 3/4" T & G. On frames 37 and 48 they will be made W.T. as far as practical by having tar paper placed between layers and caulked around all fore-and-after members. Lamp wicking will be placed between frames and planking #48 will be tight to a point about 3 ft. below the main deck. #37 will be tight to the floor of pilot house. Tar paper and sheathing will be given a heavy coat of tar immediately before being assembled. The other bulkheads are for strength purposes.

26. PILOTHOUSE:

Coaming finished 5½" x 9½" with rabbit for sheathing. Fastened to fore and aft carlins and to beams with 5/8" bolts spaced about 14". Posts at corners rabbited for outside sheathing mortised into coaming and plate. Studs generally 2½" x 3" and heavy studs as shown, on the forward end. All mortised top and bottom like the corner posts. Plate 1¾" x 3". Diagonal studs will be placed at each end of house. There will be eight holding down bolts 5/8" dia. with nuts on top of plate and on the under side of carlins, or beams. Sash will be of mahogany 1-1/8" thick, glazed with ¼" plate glass. The center sash at the forward end and the two after sash on the sides will be stationary. Others will drop into pockets. The bottom of these pockets will have a lead pan 4" high draining onto deck. There will be no bend glass. If it is necessary to make bent sash a rail may be placed in the center of the sash so that all glass can be straight. At the after end of the pilot house there will be two 10" galv. iron port lights. Outside planking will be 7/8" T & G in narrow widths. It will be run horizontal below the sash rail except on the forward end where it will be put on vertical. Ceiling will be 3/4" thick. Both planking outside and inside will be run with a V bead on one side only. Carlins of clear stock will be sawn with a crown top and bottom (same as the main deck crown) finishing 3½" x 1½". The lower edges will be chamfered. Roofing will be 3/4" T & G with V bead on the lower side. Canvas #8 turned down under a 1½" half round. Canvas to be laid in a heavy coat of wet lead paint and given a coat of thin oil paint as soon as laid. There will be two 1½" lead pipe scuppers at the after end. The water batten 1½" x 1½" will be carried all around secured with brass screws. It will be set in white lead. Flooring of Pilothouse will be 7/8" T & G laid on beams generally 2" x 3½" without crown. Beam at the ends of hatches will be heavier and strengthened in an approved manner. The flooring will be cut and trap doors arranged to swing up giving access to the steps leading to the forward stateroom and the engineroom. Hoods and stops will be arranged to hold these doors in a vertical position. Long galvanized strap hinges will be used with brass pins. A shelf will be built over the steering wheel standard. On the port side a seat placed with locker under it. The doors leading to deck will be double of 1-1/8" mahogany. There will be a mahogany companionway slide over these doors.

27. CEILING:

Ceiling of 3/4" T & G without any bead will run from the cabin floor to the deck clamp from frame 7 to 48. Blocks will be placed between ceiling and planking for port lights but care will be exercised that passageways will be left for free circulation of air by chamfering edges of these blocks.

28. CABIN FLOOR:

Cabin floor of 7/8" T & G flooring laid on 1¾" x 3½" beams spaced about 14" and supported where necessary on posts carried to ships' frames or floor timbers. Wherever required portable sections will be placed giving free access to space below. In the engine room sections will be leaf to get at all valves, cocks, etc., as may be required.

29. STATEROOM:

Stateroom fitted with two berths, one running fore and aft on the starb'd side and one thwartships at the after end of room. Under both there will be lockers with doors and drop fronts. A suitable bureau will be built and placed as shown. Between berth and bureau a wide 1½" hardwood board will be run forming a table. Locker on the star'bd side carried to the main deck, fitted with shelves, etc.

30. GALLEY & ENGINE ROOM:

Galley will be furnished complete with all fixtures usually found on a boat of this type. Range will be Shipmate #114 or equal with smoke pipe carried up the stack. It will be set on a metal galv. coal box which will be filled by 5" dia. chute carried to main deck ending in a bronze deck plate. Woodwork around and near range will be covered with sheet asbestos and galv. iron. Sink will be of the deep pattern 16" x 20" with ash or spruce drainboard as shown. Bins, lockers, and dish racks will be built.

On the portside a berth will be built for engineer with locker under it and seat in front of it.

Shelves will be built for storage battery as later mentioned in Paragraph #51.

31. MAIN CABIN:

Dresser or buffet at the forward end will be set sufficiently high so that engine coupling may be accessable. In it there will be two small drawers on top and a locker with shelves below. Other lockers will be built as shown. The one of the forward end will run to the main deck. Those on the after end will run to the Quarter-deck. A shelf will be fitted on which will be placed the heater. It will be covered with asbestos, and galv. iron. The woodwork around heater will likewise be protected.

Seats will be built as shown and a table with leaves to drop. Lockers built under all seats with portable tops.

32. SICKBAY:

Sickbay will be fitted with two berths, bureau and seat as shown. Lockers will be run to the Quarter-deck, and lockers fitted with shelves will be placed under berths with drop fronts. The locker under the seat will have the top portable.

33. LAZARET:

Flooring will be placed where required and shelves as directed. A 18" manhole plate with watertight cover and grating will give access to this compartment and a small ladder provided if required.

Bulkhead on frame 7 will have holes cut to ventilate this compartment.

34. TRUNK:

Over the engine room there will be erected a trunk as shown in the midshipsection on drawing #3. It will extend from frame 22-28 and will have six 10" galv. port light. All constructed as per detail.

At the after end of the main deck a similar trunk will be run between the quarter-deck and the main-deck and constructed in a manner similar to the engine room trunk. In it there will be six 10" port lights and two 10" x 18" dead lights of ¼" plate glass.

35. SKYLIGHT:

A 24" x 30" mahogany skylight placed on the main-deck forward of the pilothouse. It will be set on a substantial coaming with hook which can be removed from the inside. It will form an escape for the forward quarters in case of necessity. It will be fitted with thick fluted glass and galv. iron bars to protect it. Arrangement will be made to hold covers open from the lower side.

36. PLUMBING:

In each toilet room there will be a water closet like Winner made by Sands Company or equal. There will also be a porcelain wash basin with pump for drawing from fresh water tank. In the galley there will be an enameled iron sink 16" x 20" x 12" deep supplied with water from the fresh water tank and pump. Pumps for basins will be like Sands figure F 1660 (or equal) N.P. Pump of galley will be like Sands figure F 1685 with a 2" cylinder placed on the drain board.

Suction for waterclosets and discharges from them and from basins, and sink will all be provided with suitable sea cocks placed on blocks fastened to the planking in the usual style. All will be accessible.

Suction and discharge pipes of water closets will be of lead. All other plumbing pipes will be of galvanized iron of suitable size.

37. SHOWER BATH:

Shower Bath located as shown on the plans. The compartment will be carried down as low as possible and lined with #4 sheet lead and made watertight as high as the lower side of door leading into toilet room #2. At the height of the toilet room floor a grating will be fitted. A semi-rotary pump will be placed on the bulkhead with a 1" suction and the necessary three-way cocks so that this pump can draw from the fresh water service line, or from the sea and deliver to the shower, and/or to pump from the well and deliver overboard. Unions will be placed in these lines so that a power pump or pumps may be later installed. All lines will be of galvanized iron.

38. FUEL TANKS:

There will be two with a total capacity of about 750 gallons. Built of 3/16" boiler steel welded and made tight under a head of 6 feet of water. Fitted with the necessary wash plates and all pipe connections. Given two coats of Biturine solution as made by Hill Bubbell Co. before being put in position. Set on suitable foundations, well braced and secured. Tanks will have a manhole with cover attached with bronze nuts. Filling pipes will be 4". Vents 1"; supply pipes 1".

39. GASOLINE TANK:

One with a capacity of about 50 gallons made of #14 galv. ingot armco iron double riveted and soldered with wash plates and made tight under a head of 10 ft. of water. Connected to the deck with a 2" filling line with air vents carried into the open air. Given one coat of Biturine solution.

40. LUBRICATING OIL TANK:

Constructed like the gasoline tank with a capacity of about 50 gals. Filled from the main deck through a 2" pipe. It will be provided with gauge glass and faucets for drawing oil. Given one coat of Biturine solution.

41. FRESH WATER TANK:

Fresh Water Tank will have a capacity of 200 Gallons, constructed of #14 galv. ingot armco iron and made tight under a 10 ft. head of water. It will be provided with necessary connections for filling, supply, and vent pipes. Vent pipe will be carried to the open. Given one coat of biturine solution inside and out.

42. DRAINAGE:

Sumps will be located between frames 19-20, 33-34, 37-38, and suitable galv. strainers installed and connected to 1½" pipes, and carried to a manifold in the engine room on the port side. To this manifold there will be a sea connection, and a connection to the engine pump and the hand pump. Check valves will be so placed that the vessel cannot be flooded. Hand pump will be of semi-rotary type brass lined and connected to a suitable hose. All pipes in this line will be galvanized. Hand pump will be placed on the main deck aft of the deck house with a 2" pipe suction.

The bottom of the vessel will be covered with concrete to a depth later to be determined but in any case care will be taken to provide limbers so that bilge water will drain to sumps. Limbers in all cases will be large and where inaccessable galv. chains provided.

43. RAILINGS:

Around the vessel a 1¼" black pipe railing will be carried as shown on the plans. It will be well secured to the chock on the outboard side of covering board. Portable sections for gateways will be placed on each side. Painted with "Bitulumin" before being erected. At all stairways there will be grab rails mounted on bronze stanchions well fastened to bulkheads. Rails of hardwood.

44. SPARS:

Mast stepped immediately below the cabin floor. It will have a total length of about 35 ft. and a diameter of 7". Wedged and fitted with a canvas coat where it passes through the main deck. Mast bands and irons placed where shown. Lignumvitae truck with two brass sheaves. Yard will be 7'-6" long and 2" diameter fitted with withes and small blocks for pennants. A suitable boom will be installed for handling tender with blocks, falls, etc. all of approved design. All iron work will be galv. There will be two 3/8" shrouds with 3/4" turnbuckles and forged 1/4" x 2" chain plates. Spring stays will be carried to forward end of pilot house to eye bolts placed in the forward corners. All shrouds or stays will be 3/8" galv. rigging wire.

Sheer poles with three pins in each will be fitted on shrouds. Suitable flag poles will be placed at the bow and stern. Each will be set into brass deck plates and fitted with lignum vitae truck with bronze sheaves and penants. The necessarycleats will be fastened to poles where required.

45. STACK:

Of a height as shown on the plans rolled to shape 36" x 26" of Armco ingot #12 iron. Seams and butts rivet flush on the outside. At the top of the stack there will be a ¼" x 2" ring. Two feet below the top there will be a similar ring fitted with four 3/8" wire eyes for guys. At the bottom of the stack there will be a 2½" x 2½" x ¼" angle ring with stack set into the bosom of the ring. All rings will be fastened to stack with 5/16" rivets spaced not over 2½". The horizontal flange of the angle ring will be drilled with holes to fit #18 c.k. headed wood screws, spaced not over 3" centers. All rings will be given a heavy coat of Biturine Solution as made by Hill & Bubbell Co. before they are fitted onto stack. A ¼" steel plate will be placed over the top of the stack and fastened to it with four clips so that the lower edge of angle bar which is placed on the edge of the plate will be ½" below the top of the upper edge of stack plate. The angle around the edge of the top plate will be 2" x 2" x ¼" with plate set into the bosom of the angle. The plate and angle will project 2" all around beyond the stack. Angle will be fastened to the top plate with ½" C.K. headed rivets spaced not over 3" and made water-tight. On the lowerside of this plate there will be two 1½" x 1½" x ¼" stiffening angles which will rest on top of stack. This plate and angle bar will be painted like the rings above

mentioned before being assembled. The top plate will support the exhaust pipes from both engines and the stove pipes. For this purpose flanges will be riveted to this plate into which all pipes will be screwed. After the stack is completed it will be given on inside and on top one coat of BITURINE SOLUTION as made by Hill & Hubbell Co. There will be four guys of 3/8" galv. rigging wire set up with 5/8" turnbuckles engaging with eyebolts placed in the top of engine room of trunk. The inside of stack given one coat of Biturine Solution and the outside BITULUMIN.

46. STEERING GEAR:

A 36" diameter hardwood steering wheel placed on a suitable standard, of wood, mounted on a bronze shaft with a bronze sprocket meshing with a bronze chain. All of a suitable size for this boat. Chain connected with a 3/8" flexible steel rope leading over 9" sheaves and through fair leads to the quadrant. For as far as possible the leads along the side will be of 3/8" rods placed in galv. pipe. The inside of pipes, rods and wire will all be given a heavy coat of stockholm tar and oil. Sheaves will be metaline bushed. Means for talking up slack will be made at the quadrant with 3/4" screw eyes and lock nuts. Quadrant will be of a forging of about the size as shown on the plans. Securely fastened to the stock with key and set screw.

The weight of the rudder will be carried on an iron casting placed on a beam about 12" below the quarter deck beams. It will be fitted with grooves on the inside and outside with a bronze ring in the usual manner and of approved size.

Over the stock a 5" bronze deck plate will be let into the deck for use when a spare tiller is required.

SPARE tiller will be supplied about 42" long and will span the top of rudder stock.

47. RUDDER:

The rudder will be sheared from a steel boiler plate 3/8" thick and riveted into a slot cut in stock. Stock will be 2½" diameter squared on the top for spare tiller, keyed for quadrant slote cut for blade.

Trunk casting will be bolted to the under side of the horn timber. It will be of iron and babbitted. A 3" pipe will screw into the top of this casting and will extend to the underside of the bearer casting.

Skeg will be forged from a 6" x 1½" steel upset on the after end forming boss for pintle. At the sternpost it will have arms forged on as shown. It will extend forward with arms forged on the forward end. From the sternpost forward it will taper in thickness to 7/8".

48. DECK FITTING:

The builder will supply all cleats, chocks, eyebolts, ring bolts, etc. as may be required and secure same in a suitable manner. All will be of galvanized iron. The bow chocks will rivet to a 3/8" deck plate and after holes are drilled for fastening to breasthook the whole will be galvanized. The cleats generally will be 18". The chocks will be let into the piece running on the outboard edge of the covering board.

All filling connection will be of brass plates, and all appropriately marked. Filling pipes for fuel tanks will be 4". Filling pipes for all other tanks will be 2".

An 18" galv. manhole plate with water tight cover and grating will be placed over the lazaret.

49. PAINTING:

All faying surfaces of all lumber entering into the construction of the hull will be given a thick coat of carbolinioum. In cases where it is not possible to cover with same both faying surfaces (like the inside of some strakes of planking and ceiling) the surface of the member against which this piece is to come in contact will be given two coats of carbolinioum, the second coat immediately before the pieces are brought together.

The bottom of the vessel on the outside up to the boot top will be given three coats of copper paint, Cape Cod or equal. The last coat within 24 hours of launching.

Top sides and house to be given a priming coat of red lead, then two coats of the best white lead, and the final coat after the vessel has been accepted.

Colors in all cases will be as desired by the owners.

All hardwood shellaced and varnished with the best spar varnish.

The rubbing strips on the fenders will be oiled.

The weather deck coated with a mixture of pine tar and raw linseed oil.

The inside given three coats of white lead and oil and the final coat of a color as selected by the owners.

Ironwork not galvanized will be given a coat of red lead or biturine solution as directed. Rudder and all steel and iron coming under the water given a coat of anti corrosive and two coats of anti fouling paint.

The hailing port and name will be painted in suitable letters on bow and stern as required by law.

All equipment, whether supplied by him or by owners, will be marked by the contractor.

50. HEATING:

The vessel will be heated by a boiler-radiator placed in the Main Cabin with smoke pipe connected to stack from range and carried up into main stack. The boiler will be similar or equal to Arcola #0. It will be connected with radiators placed in different parts of the boat as follows:

One 5-A	Peerless Radiator (or equal)	in each toilet room
One 7-B	Ditto	in Stateroom
One 7-B	Ditto	in Sick Bay
Two 7-B	Ditto	in Pilothouse

An expansion tank will be placed in the stack, with gauge, etc. on the Boiler. The pipes will be so run that any radiator may be cut out without affecting the circulation to the other radiators. Valves will be placed at the radiators for the incoming and outgoing water. Pipes will be so run that there will be no air pockets. The woodwork back of the radiators will be covered with asbestos and galv. armco iron.

51. ELECTRIC LIGHTING:

The vessel will be lighted throughout with electricity. The lights will be distributed in the cabins as shown on the plans, there being about eighteen outlets with keys on each socket. In addition to these there

will be the usual navigating lights with controls in the pilot house, All lights will be suitable for a 32 volt pressure and will be of 15 watts mazda type. Wires will be rubber covered, of a size such that there will not be more than a 2% loss at the farthest point when all lights are burning.

All inside wires may be run in moldings concealed where possible or molding matching woodwork. Outside wiring and fixtures will be water and weather proof.

Generator will be mounted on a frame placed on main engine and run from a belt off of the flywheel. It will have a capacity of not less than ½ K.W. with a pressure sufficient to fully charge the storage battery. It will be of the marine type.

Storage Battery will be of a size to run all lights for 8 hours without recharging. It will be of the Exide type, and placed on suitable shelves in the engine room.

A switchboard will have all necessary fittings for the proper working of the system. All parts will be appropriately marked and all instruments and other fittings fastened with brass screws. Over the pilot house there will be a searchlight of the Cooley type or equal, controlled from within the pilothouse.

Important.

52. WINDLASS, ANCHORS, ETC.

The Contractor will supply a pump windlass Cunningham make or equal and securely fastened it to main deck as shown. It will be equipped to take 7/16" and 9/16" anchor chains and to handle a 150# and a 300# anchor. The windlass will be galvanized.

Anchors will be supplied by the contractor and connected to the chains with chackles. Swivels will be fitted in the lines where necessary. The contractor will furnish 40 fathoms of 7/16" BB short linked chain and 50 fathoms of 9/16". Wildcats on windlass will be made to fit these chains.

Suitable beds will be made for anchors to be housed on deck when necessary. Eyebolts and lashing will be provided.

Davit for handling anchors will be 2" in diameter passing through the main deck and set on a casting on the breasthook.

The necessary tackle with 5" ash blocks will be provided with trip hook of approved design.

53. PROPELLING ENGINE:

Will consist of a full diesel engine of one of the following:- 60 H.P. Washington Estep, 70 H.P. Washington Estep, 65 or 75 Atlas Imperial, 70 H.PP Enterprise, 67 Eastern Standard, 70 H.P. Miamus 65 H.P. Union.

The bidders may put in figures on one or more makes and all will be submitted to New York. The engine will be completely installed with bronze propeller wheel, tail shafting, and outboard bearing and stuffing box of bronze. Exhaust will be fitted with a suitable muffler placed in the stack. The engine truly lined after the vessel is afloat, with a steady bearing in the intermediate shaft. All shafting will be up to Lloyd requirements. The engine will be connected up to the "day-tank" with a pump to supply the day-tank from the main tanks. Strainers placed in the lines as usual. All water piping will be of brass up to the engine; the discharge will be above the water line and will be of galv. iron. In all lines suitable valves will be placed where requiredand valves placed at each tank. Control rods will be carried to the pilot house so that the engine may be run from that point. The leads will be such that head room will not be sacrificed.

A suitable whistle will be placed on the stack with leads, pulls, and gauges placed in the pilothouse.

The entire installation of the engine will be up to the best marine practice.

Over all seacocks suitable bronze strainers will be placed.

There will be two intake connections for this engine.

54. AUXILLIARY ENGINES:

A suitable gas engine and air compressor will be supplied for charging air bottles. The exhaust from this engine will be carried to a muffler and go overboard on the portside. A goosenock placed in the line.

55. AIR BOTTLES:

Will be placed under the cabin floor aft of the engine room and all connections will be tight. They will be connected to a whistle tank and a reducting valve placed in the line keeping the whistle tank at 80 pounds pressure.

56. EQUIPMENT:

The owner will furnish all bed springs, bedding, mattresses, cushions, linolium, curtains, shades, dishes, glass ware, cutlery, crockery, cooking utensils, mirrors, toilet-room fittings, towels, life boat, life buoys, preservers, fire extinguishers, compass, binnacle, navigating instruments, charts, hawsers, flags, lanterns.

The contractor will furnish a 8" heavy pattern ship bell with pull arranged to handle from pilothouse. The contractor will also furnish and install gong and jingles, for controlling engine, visor of galv. iron over the pilothouse front windows, provide navigating lights with suitable screens to pass inspection. All frames for necessary navigating papers, name board to be placed over pilothouse, if required.

If a steel rudder is used the contractor will furnish and fit two ½" x 4" x 12" pieces of zinc, one for each side of sternpost and securely fastened to same.

57. CLEANING:

The vessel will be kept as clean as possible during construction and before being delivered to the owners it will be thoroughly cleaned, the bilges, and all other parts freed of all chips, shavings, etc. and all paint work put in first class shape.

58. TRIAL TRIP:

The contractor will give the vessel a satisfactory trial trip before being turned over to the owners. This trial will last not less than six hours and all defects that develop will be made right and if necessary another trial will be held. All gear will be tried out and when all is satisfactory the boat will be returned to the contractors yard the finishing touches completed.

59. DELIVERY:

The boat is to be turned over to the owners after being accepted when the contracted is completed at Seattle on or before September 15, 1925.

The Owners reserve the right to reject any and/or all bids.

60. ADDENDA:

In addition to the foregoing paragraphs to be figured upon, the contractor will also give separate charges for certain proposed changes in the following paragraphs:

61. OIL BURNER FOR RANGE:

In place of coal being used in the range as mentioned under #30 a burner for kerosene will be installed with a 50 gallon fuel tank placed on deck as later decided.

62. HOT WATER BOILER:

A 15 gallon "kitchen tank" to be connected to a hot water front placed in the range. This tank will be supplied by the galley pump.

63. WATER CLOSETS:

The closets to be like Sands "SPEDIT" in place of the "Winner" as mentioned in paragraph 26.

64. POWER PUMP FOR SHOWER BATH:

In addition to the hand pump as mentioned in #37 an electrically driven direct connected rotary pump will be installed to work with or in place of the hand pump.

65. BOAT DAVITS:

Installed in place of boom as called for in #44.

66. FOREMAST:

Foremast of about the same size as the main mast as mentioned in paragraph #44, and completely outfitted with stays, turn buckles, etc. and also to have running rigging for a sail. (The sail to be furnished by the owner.)

67. The rudder, stock, sleeve, and skeg to be of bronze in place of iron and steel as mentioned in #46 & #47.

68. STORAGE BATTERY:

To be of the Edison type.

69. WINDLASS:

Windlass to be connected to the main engine by a shaft running under the cabin floor. Clutch to be in shaft line and operated from the forward deck. In this connection it might be well to mention that the fresh water tank must be divided so that shaft can be easily installed.

70. FLOORING OF RAECOLITH:

The flooring in the sick bay, and toilet rooms will be covered with raecolith or equal with border turned up 4" all around.

71. LENGTHENING:

A price per foot is asked for increasing the length of the vessel above that as shown and mentioned in the foregoing specifications.

72. INCREASING BEAM:

A price is also asked for increasing the beam of the vessel one foot more than that called for in these specifications or shown on the plans.